## Remarks

In the interest of clarity, the paragraph numbers hereafter match the paragraph numbers in the Office Action.

As an initial matter Applicant noticed that the Examiner did not indicate the status of claim 19. Applicant believes that the Examiner intended to reject claim 19 in light of Mazzara instead of rejecting claim 18 and has proceeded in an appropriate fashion.

1-2. The Office Action rejected each of claims 1-3, 5, 10, 11, 15, 16, 18 and 20 as obvious over Mazzara. Applicant respectfully traverses this rejection with respect to claim 1 and has amended claims 10, 15 and 19 to overcome the rejections as suggested by the Examiner and as indicated below.

Claim 1 requires, among other things, an acceleration error determiner for generating an acceleration error that is the difference between a derivative of a command velocity and a motor acceleration value (i.e., an acceleration feedback value associated with a motor) and a low pass filter for filtering the error. Mazzara fails to teach or suggest either the determiner or the filter required by claim 1.

With respect to the phrase "command velocity", that phrase is used in the present specification to mean an actual commanded velocity value that is set as a target parameter for machine operation and is not meant to cover a velocity error value. To this end, see Fig. 8, of the present specification that shows a command velocity value $\omega^*$ that is provided to summer 114 where summer 114 subtracts a velocity feedback signal $\omega_{fb}$ from command velocity $\omega^*$ to generate an error that is provided to regulator 124. Regulator 124 steps up the received value to provide an output signal to summer 126.

Velocity feedback $\omega_{fb}$ should be contrasted with the derivative of the command velocity value $a^*$ that is generated by derivative block 116. Consistent with claim 1, the

derivative a* of the command velocity $\omega^*$ is provided to summer 132 (i.e., to an acceleration error determiner) that subtracts a motor acceleration feedback value $a_{fb}$ from derivative a* and generates an acceleration error that is provided to filter 134. Thus, in the present specification, the derivative of a command velocity is clearly different than a derivative of a velocity error value.

With respect to the term "derivative", that term is used in the present specification to refer to an actual derivative value. Thus, for instance, the derivative of a velocity value is an acceleration value.

Turning to Mazzara, Mazzara teaches a system where an acceleration feedback signal 33 is subtracted from the output of a velocity compensator 31 and that compensator 31 is either a proportional (P), a proportional/integral (PI) or a proportional/integral/derivative regulator (see col. 6, lines 16-18). Thus, compensator 31 is not simply a derivative block and instead includes both proportional and integral activities in addition to derivative activities so that the output of compensator 31 is different than the derivative of the input. Therefore, even if the input to compensator 31 where some how construed as being a command velocity, the output signal is not the derivative of the input and summer 38 is not generating an acceleration error by subtracting an acceleration feedback signal from the derivative of a command velocity value. For at least this reason Applicant believes claim 1 is novel over Mazzara.

In addition, the input to velocity compensator 31 is a velocity error value which is different than a command velocity value as required by claim 1. To this end, Mazzara teaches that converter 15 generates a position feedback signal, a velocity feedback signal and an acceleration feedback signal on lines 19, 27 and 33, respectively. Processor 26 generates a desired position signal 21 (i.e., the position signal is a command signal) that is fed to summer 20 which subtracts the position feedback signal 22 from the desired position signal 21 to generate a position error signal 23. Controller 24 steps up the position error signal to generate a compensated position error signal 25 that is fed to summer 28. Summer 28 subtracts the velocity feedback signal 27 from

the compensated position error signal 25 to generate a velocity error signal 30 that is stepped up by controller 31 to generate a compensated velocity error signal 32. Compensated velocity error signal 32 is provided to summer 38. Summer 38 subtracts the acceleration feedback signal 33 from the compensated velocity error signal 32 to generate an acceleration error signal 35.

Thus, referring to Fig. 8 of the present application, Mazzara teaches a system where regulator 124 includes a derivative portion (i.e., regulator 124 would be a PID regulator) and where acceleration feedback signal $a_{fb}$ is subtracted from regulator 124 output. Subtracting feedback signal $a_{fb}$ from the output of regulator 124 is clearly different than the activity performed by summer 132 in Fig. 8 where feedback signal $a_{fb}$ is subtracted from a true derivative of a command velocity value $\omega^*$. For this additional reason Applicant believes claim 1 is novel over Mazzara.

Moreover, Mazzara's Fig. 12 appears to teach taking the derivative of a velocity command signal (see top block next to the 1638 block) and adding that value at 77 to a compensated (i.e., PID regulated) acceleration command value (see the output of 74 that feeds a PID regulator). Thus, where Mazzara contemplates taking the derivative of a velocity command, another value is not subtracted from the derivative but rather is added to the derivative. For this additional reason Applicant believes claim 1 is novel over Mazzara.

With respect to the low pass filter limitation, while Mazzara does suggest that noise should be minimized, Mazzara fails to teach or suggest a filtering process to achieve such a function. In this regard, Applicant notes that 76 in Fig. 12 and 36 in Fig. 1 are not filters and instead are a PID regulators which, if anything, teaches away from providing a low pass filter (i.e., a PID regulator is clearly not a low pass filter). Nothing in Mazzara even remotely suggests that a low pass filter is necessary or may even be advantageous.

Claim 10 has been emended to include the limitations from original claim 12 without the limitation of claim 11. The Examiner indicated that claim 12 would be allowed if placed in independent form and therefore Applicant believes that claim 10 should not be in condition for allowance.

Claim 15 has been amended to now include limitations similar to the limitations of original claim 12 (i.e., that an acceleration error time constant is between two and four times a velocity error time constant). Because claim 12 was indicated as being allowed, Applicant believes claim 15 should now be in condition for allowance.

Claim 19 has been amended to now include limitations similar to the limitations of original claim 12 (i.e., that an acceleration error time constant is between two and four times a velocity error time constant). Because claim 12 was indicated as being allowed, Applicant believes claim 19 should now be in condition for allowance.

3. Applicant thanks the Examiner for indicating that several of the originally filed claims would be allowed if rewritten to include limitations in intervening claims. Applicant has amended claim 6 to include the limitations of original claim 1 and therefore claim 6 should now be in condition for allowance.

In addition, as indicated above, Applicant has amended each of independent claims 10, 15 and 19 to include similar limitations to original claim 12 that was indicated as novel over Mazzara and thus each of claims 10, 15 and 19 and claims that depend therefrom should be in allowable form. Claim 17 has been amended to eliminate duplicative language. Claim 21 has been similarly amended

Applicant has introduced no new matter in making the above remarks. In view of the above remarks, Applicant believes claims 1-11 and 13-22 of the present application recite patentable subject matter and allowance of the same is requested. No fee in

addition to the fees already authorized in this and accompanying documentation is believed to be required to enter this amendment, however, if an additional fee is required, please charge Deposit Account No. 17-0055 in the amount of the fee.

Respectfully submitted,

THOMAS J. REHM

Date: 12-9-05

By: _____

Michael A. Jaskolski
Reg. No. 37,551
Attorney for Applicant
QUARLES & BRADY, LLP
411 East Wisconsin Avenue
Milwaukee, WI. 53202-4497
(414) 277-5711